SEMINAR

Plasma Physics Division
Naval Research Laboratory

Speaker: **Noel A. Guardala and Jack L. Price**
Positive-Ion Accelerator Facility
Naval Surface Warfare Center/Carderock
Carderock, MD

Title: **Triggered Isomer Energy Release for Pulsed Power Applications and Directed Energy Weapons Systems**

Date: **Monday, 1 November 2004**

Time: **1:30 p.m.**

Location: **Bldg. 101, Room 115**

The ability to control rapid releases or pulses of "stored energy" in the form of emitted radiation, particle and photon, from nuclear isomers is highly desirable for DoD uses in power source/system applications as well as for concepts in Directed Energy Weapon, DEW development. In particular two isomers, the 141 yr ^{242m}Am and the 410 yr ^{108m}Ag have several very attractive attributes for advanced power system development. These types of systems could be described as "*nuclear capacitors*" or "*nuclear batteries*" to the devices we are presently familiar with that use chemical or electrical energy for power production. In the area of DEW use the 160.4 d ^{177m}Lu appears to have significant promise due to the possibility of releasing over 1 MeV of gamma ray energy in timescales of ca. 20 ns. We propose a systematic and thorough research program primarily using the NSWCCD 3 MV tandem to study the probabilities, pathways and mechanisms for the triggering process in these isomers as well as for some other suitable ones. In particular, emphasis will be placed on studying the efficiency and cost of using compact high-intensity external sources of radiation to induce the triggering. In addition, a related and parallel research effort in developing devices and components that could convert this released high-energy radiative energy directly into electricity will be discussed and evaluated for both near and long term use and development.

Contact ppd-seminars@ppd.nrl.navy.mil for more information.